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NATURAL GAS STAR PROGRAM

PARTNER UPDATE

Natural Gas STAR Program Expands to the Gas Processing Sector

After 6 years in partnership with the natural gas industry, the Natural Gas STAR Program is expanding to include gas gathering and processing companies. Including this important industry sector in the STAR Program will help maximize the opportunities for cost-effective methane emissions reductions across the industry, with benefits both for the environment and for participating companies' bottom lines.

Recent EPA studies indicate that processing operations offer significant potential for profitable emissions reductions. Up to 25 billion cubic feet (Bcf) of gas may be saved annually through cost-effective management practices, representing over 70 percent of total estimated emissions from the sector.

Natural Gas STAR anticipates enthusiastic participation from gas processing companies. The Gas Processors Association, the principal trade group for the sector, has recently endorsed the STAR Program. In addition, GPM Gas Corporation, a subsidiary of Phillips Petroleum Company, has signed on as the program's first Charter processing partner. EPA will build on this support and tap into industry expertise as we implement the expansion of the Gas STAR Program.

Growing Interest in the Processing Sector

Natural Gas STAR Partners in the production, transmission, and distribution sectors of the industry have long known that reducing gas loss through smart emissions reduction practices could increase profitability. Last year, partners reduced methane losses by 21 Bcf, worth approximately $42 million. These efficiency increases have been attracting the attention of gas processing companies.

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Gas STAR on the WEB

Visit the Gas STAR web site at WWW.EPA.GOV/GASSTAR

IN THE SPOTLIGHT

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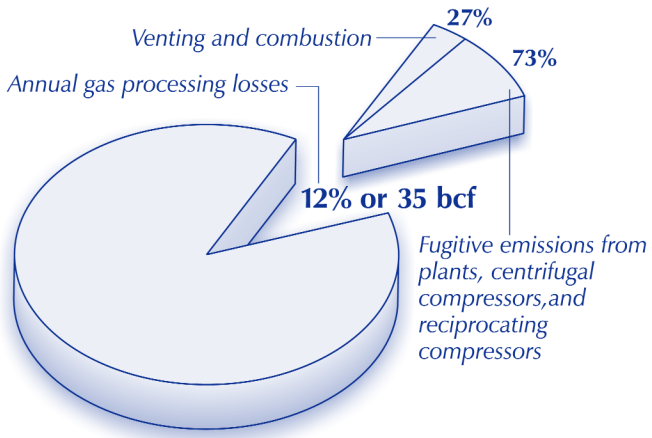
Gas STAR Expands to the Gas Processing Sector



Total Annual Methane Emissions from the Natural Gas Industry

Gas STAR welcomes its first gas processing partner, GPM Gas Corporation.

Although some STAR Partners include gas processing facilities in their program implementation, gas processing operations in many companies are separate from other business units. As a result, gas processing operations comprise a distinct industry sector that presents its own economic opportunities for reducing emissions. With the support of the Gas Processor's Association (GPA), which has pledged to promote the program to its 140 member companies, Natural Gas STAR will help companies seize these opportunities. And in controlling gas losses, gas processors help protect the environment—reducing emissions of methane, a potent greenhouse gas, can help lower the risk of global climate change.

Emissions Reduction Opportunities

There is much to be gained by expanding Gas STAR. EPA studies have found that processing facilities account for about 12 percent of the annual methane emissions from the gas industry, or approximately 35 Bcf. Of these annual losses, most (73 percent) are fugitive emissions from plants, centrifugal compressors, and reciprocating compressors. The remaining 27 percent results from venting and combustion—for example, from kimray pumps, reboiler vents, pneumatics, and engine exhaust. EPA estimates that processing facilities could reduce these losses by 20-25 Bcf by implementing measures that are cost effective at conservative gas prices.

To further analyze economic opportunities for reducing emissions, EPA has awarded funding to the Gas Research Institute (GRI) to demonstrate a cost-effective program for reducing emissions from gas processing facilities. GRI proposes that using a volumetric measurement device—the Hi-Flow Sampler™—to identify the leakiest components will allow companies to prioritize leak repair, while reducing leakage by as much as 70 to 80 percent at a profit to the company. GRI's techniques have already proven successful for natural gas transmission systems and hold similar promise for natural gas processing plants.

An industry Project Advisory Group will lead the GRI project, and four gas processing facilities will be selected as host sites for the demonstration. Leak characterization at each site will provide a comprehensive database that can generate a cost-benefit analysis when survey and repair costs are supplied. Using the data, companies will be able to develop leak repair schedules to meet any desired methane reduction or payback period requirements.

GRI has a high degree of confidence in this method and, as a result, is offering participating companies a guarantee on their return. Companies providing host sites will contribute to offset the cost of the measurement work, but will be reimbursed by GRI if their savings in avoided emissions do not equal their initial contribution. "It is really a win-win project—companies can reduce emissions and operating costs and increase earnings," says GRI project manager Robert Lott.

GPM Gas Corporation Leads the Way

GPM Gas Corporation is already enjoying the benefits of STAR. This past spring, GPM, a Houston-based processing subsidiary of Phillips Petroleum Company, joined the program as the first Charter processing partner. GPM is enthusiastic about the expansion of Gas STAR. According to Safety and Environmental Manager Les McMillan, "Opportunities exist both in operating practices and in improved maintenance practices. We are excited about capturing those opportunities and the potential synergies that can occur as other gatherers and processors come into the program."

GPM supports the environmental goals of the STAR Program. GPM's President and CEO, Michael Panatier, commented at the signing of the MOU, "We share EPA's concern for and commitment to reducing methane emissions. This is an ideal that should be embraced by any organization in the natural gas business, from the wellhead to the end user."

GPM is currently developing a methane emissions reduction plan that emphasizes the Gas STAR Program's recommended measures, such as maximizing the efficiency of glycol dehydrators and implementing directed inspection and maintenance programs at processing plants and compressor stations. The company is also considering further opportunities specific to gas processing equipment.

Next Steps in Expanding the STAR Partnership

EPA is already taking steps to establish the new program area for gas processors. Interested companies are providing feedback to STAR on management practices that help reduce methane emissions. In addition, a new Memorandum of Understanding (MOU)—which processing companies will sign to become partners—is being developed by EPA in consultation with GPA and industry representatives. The gas processing MOU will specify core best management practices recommended for reducing gas losses from processing facilities. Finally, EPA is also developing implementation tools and technical support documents to help processors take full advantage of the Natural Gas STAR Partnership.

…methane emissions reduction…"is an ideal that should be embraced by any organization in the gas industry…"

Michael Panatier, President and CEO
GPM Gas Corporation

Companies interested in receiving more information about these new initiatives, or interested in joining Natural Gas STAR, may contact Carolyn Henderson at 202/564-2318, or by e-mail at henderson.carolyn@epa.gov. Additional information on the STAR Program can be found at www.epa.gov/gasstar.

Companies interested in participating in the GRI leak detection project, either as a host site or a member of the Project Advisory Group, should contact Robert Lott of GRI at 773/399-8227.

NATURAL GAS STAR NEWS

STAR Welcomes New Partners and Endorsers

EPA is pleased to recognize five new partners and two new endorsing organizations that have joined Natural Gas STAR since the spring.

New Partners

Based in Dallas, Texas, **Atmos Energy Corporation** serves over 1 million customers in 13 states, distributing natural gas through its five distribution business units. Energas Company (Lubbock, Texas) services the agricultural market. Greeley Gas Company (Denver, Colorado) provides natural gas to customers in Colorado, Kansas, and Missouri. Trans Louisiana Gas Company (Lafayette) delivers natural gas for use in commercial buildings. United Cities Gas Company (Franklin, Tennessee) serves high-growth residential areas around Nashville, Tennessee, and Overland Park, Kansas. Western Kentucky Gas (Owensboro) has a large industrial base and continues to increase its services to residential and commercial customers.

Columbia Gas Transmission and Columbia Gulf Transmission—subsidiaries of Columbia Energy Group—operate 16,700 miles of pipeline. Columbia Gas has its headquarters in Fairfax, Virginia, and Charleston, West Virginia. The company's 12,500-mile pipeline moves 3 Bcf of natural gas per day across the midwest, northeast, and mid-Atlantic. Columbia Gas also operates one of the largest natural gas storage systems in the United States, with 220 Bcf of capacity. Columbia Gulf, with headquarters in Houston, Texas, operates a 4,200-mile natural gas pipeline system stretching from the Gulf of Mexico to Virginia. Together, these systems have the capacity to move up to 5 Bcf of natural gas per day.

UtiliCorp United is an international energy services company based in Kansas City, Missouri. UtiliCorp owns and operates over 26,000 miles of natural gas production, transmission, and distribution pipeline in the United States, serving 830,000 customers. UtiliCorp's U.S. subsidiaries include Michigan Gas Utilities, Missouri Pipeline Co., Missouri Public Service, Northwest Minnesota Utilities, Omega Pipeline Co., People's Natural Gas, and West Virginia Power. Aquila Energy, a wholly owned subsidiary, markets natural gas and electricity to industrial and wholesale customers throughout the continental United States. UtiliCorp United will implement STAR Best Management Practices (BMPs) in both its distribution and processing operations.

STAR's newest producer partner is **Phillips Petroleum Company**, based in Bartlesville, Oklahoma. Founded in 1917, Phillips is a major integrated oil and natural gas company with worldwide operations. Phillips produces about 1 Bcf of natural gas per day in the United States, with 1998 domestic production totaling 346 Bcf. An additional 1.5 Bcf per day is produced worldwide. Phillips' four key business areas are Exploration & Production; Gas Gathering Processing & Marketing; Refining, Marketing & Transportation; and Chemicals & Plastics. GPM Gas Corporation, which joined the Gas STAR Program this past spring, is Phillips' principal gathering and processing company.

New Endorsers

A new endorsing organization, the **Domestic Petroleum Council** (DPC) is a national trade association representing large, independent U.S. natural gas and crude oil exploration and production companies. DPC works for sound energy, environmental, and related public policies that encourage responsible exploration, development, and production of natural gas and crude oil. As a group, DPC companies drill more than 80 percent of independent U.S. wells (47 percent of all domestic wells) and produce over 16 percent of domestic natural gas. In endorsing the Natural Gas STAR Program, DPC sees an opportunity to build relationships between government and the private sector. The Council believes its member companies can benefit from joining Gas STAR and taking advantage of the program's opportunities for technology transfer and information exchange.

The **Gas Processors Association** (GPA) recently elected to endorse Natural Gas STAR. GPA is the primary industry association representing natural gas gathering and processing interests. Founded in 1921 and based in Tulsa, Oklahoma, GPA has developed and evolved along with the gas processing industry. The Association is a focal point for the industry and a clearinghouse for issues and developments in gas processing. Today, GPA is an incorporated, non-profit trade association of approximately 140 U.S. and international member companies, all of whom are engaged either in the processing of natural gas into marketable pipeline-quality gas, or in the manufacture, transportation, and further processing of natural gas products. With the endorsement of GPA, Natural Gas STAR is expanding its program to better include the gas processing sector and help GPA member companies take advantage of cost-effective technologies and practices to reduce methane emissions.

Natural Gas STAR in the News!

On October 13, 1999, the Natural Gas Supply Association (NGSA) released a report on the accomplishments of Natural Gas STAR Partners titled "Reducing Greenhouse Gas Emissions: Good Business for Natural Gas Producers." The study found that more than half of NGSA's member companies participate in the STAR Program. Through their participation, these companies have reduced methane emissions by 50 Bcf. Catching the attention of industry press, the NGSA report was cited in ***Air Daily*** on October 14, and ***Inside FERC*** on October 18.

The Fall 1999 issue of the Gas Research Institute publication ***Gas TIPS*** featured an article on the Natural Gas STAR Program by Editor Karl Lang titled "Industry-Government Partnership Increases Revenues by Reducing Methane Emissions." The article was then excerpted and reproduced in ***Hart Show Daily*** and distributed to the 7000-plus registrants at the Society of Petroleum Engineers 1999 convention in Houston in early October.

Look for other articles on the Natural Gas STAR Program in the October issue of ***Hydrocarbon Processing*** and in the December issue of ***American Gas***.

PARTNERS OF THE YEAR

Consolidated Edison Company of New York:
Distribution Partner of the Year

Consolidated Edison Company of New York (ConEd), a Charter Partner of the Natural Gas STAR Program, was named 1999 Distribution Partner of the Year. EPA honored Consolidated Edison for excellent program implementation, outreach efforts, and promotion of the STAR Program's economic, safety, and environmental benefits.

Since joining in 1993, Consolidated Edison has achieved impressive results by implementing the Natural Gas STAR Program. The company's 1998 annual methane reductions totaled 207 million cubic feet (Mmcf), bringing ConEd's total program reductions to date to 1.8 Bcf, valued at $3.6 million.

Consolidated Edison has consistently implemented STAR's core Best Management Practices (BMPs) of directed inspection and maintenance at gate stations and surface facilities, and repair and replacement of leaky distribution pipe. In addition, ConEd has identified and implemented several Partner Reported Opportunities (PROs). In 1998, these included (1) reinjection of blowdown gas, and (2) system pressure downgrading with the use of clocking solenoids and supervisory pressure control stations.

ConEd's participation in Gas STAR extends beyond the use of gas-saving BMPs. During this past year, the company contributed to EPA's recently released Natural Gas STAR Transmission and Distribution video, providing staff for interviews and facility footage for the tape. In addition, ConEd's strong support of the program and assistance with the development of outreach materials has helped spread the word about Natural Gas STAR across the industry.

Consolidated Edison is a regulated utility providing electric service in New York City and natural gas in Manhattan, the Bronx, and part of Queens and Westchester.

Enron: Transmission Partner of the Year

Enron Gas Pipeline Group received the 1999 Natural Gas STAR Transmission Partner of the Year award. For the third year in a row, Enron was recognized for outstanding contributions to the STAR Program in the areas of technology development, outreach, and program implementation.

Enron continued its exemplary implementation of Natural Gas STAR Best Management Practices (BMPs) and Partner Reported Opportunities (PROs) in 1998, resulting in total 1998 reductions of 2.48 Bcf. This one-year savings accomplishment is not only higher than Enron's total savings from previous years, but also the highest annual transmission company reduction ever reported to the STAR Program! Since joining in 1993, Enron has reduced methane emissions by over 4.3 Bcf, worth more than $8.6 million.

Enron has continued to achieve excellent results through participation in the EPA/GRI/PRC Leak Detection and Repair Program. In 1998, 60 compressor stations were surveyed using the Hi-Flow Sampler™. By the end of 1998, all stations in five of Enron's pipeline companies had been surveyed. Enron's emissions reductions resulting from the directed inspection and maintenance program totaled 523 Mmcf in 1998, worth over $1 million.

Enron also reported using 10 PROs in 1998. These included the (1) lowering of pipeline pressure prior to maintenance, (2) installation of electric motors, and (3) replacement of wet gas seals with dry gas seals on turbines.

Enron has been a strong supporter of STAR Program outreach activities. Enron provided staff and video footage for the newly released Natural Gas STAR Transmission and Distribution video. Enron has also continued to provide information and guidance to companies interested in joining the STAR Program.

Enron's pipeline group operates 32,000 miles of high-pressure pipeline in six companies across the United States—Northern Natural, Transwestern, Florida Gas, Louisiana Resources, Northern Border, and Houston Pipeline.

Richard Felt (l), Senior Operations and Maintenance Technician, Enron Gas Pipeline Group, and Marc Phillips (c), Manager, Regulatory Technical Analysis, Enron Gas Pipeline Group, accept the Transmission Partner of the Year award from Natural Gas STAR Program Manager Paul Gunning (r).

Chevron U.S.A. Production Company:
Producer Partner of the Year

Chevron U.S.A. Production Company received the 1999 Natural Gas STAR Producer Partner of the Year award. The company was honored for achieving significant methane emissions reductions, furthering industry knowledge in emission-reducing technologies, and making major outreach contributions to the STAR Program.

Chevron has been an active participant in the Natural Gas STAR Producer Program since becoming a Charter Partner in 1995. The company reported nearly 2 Bcf in reductions in 1998, bringing the firm's cumulative reported methane emissions reductions to 9.0 Bcf for activities since 1990.

Robert Sandilos (l), Legislative and Regulatory Advocate, Chevron U.S.A. Production Co., accepts the Producer Partner of the Year award from Natural Gas STAR Program Manager Paul Gunning (r).

Chevron has been successful not only in implementing the STAR Program's core Best Management Practices (BMPs), but also in identifying and implementing Partner Reported Opportunities (PROs). PROs implemented by Chevron in 1998 include (1) reinjecting produced natural gas at off-shore processing facilities, (2) installing a compressed air controller retrofit, (3) reducing venting through flares and spent-gas recombustion, (4) increasing the frequency of leak detection and repair, and (5) surveying and repairing the gathering system leaks. By describing all methane reduction activities in its annual report to STAR, Chevron helps to increase the body of experience and data that fuels the Natural Gas STAR Program's technology transfer process.

Chevron's commitment to Natural Gas STAR includes involvement in many outreach and technology transfer activities. The company hosted the Regional Producer Technology Transfer Workshop in Bakersfield, California in September 1999. Chevron staff presented their experiences with implementing the Gas STAR Program at the Bakersfield Technology Transfer Workshop and again at the 6th Annual Implementation Workshop in Houston, Texas. Chevron has also assisted EPA in developing Natural Gas STAR outreach materials.

Active in more than 90 countries, Chevron Corporation is one of the largest international integrated petroleum companies. In the United States, Chevron is the third largest producer of natural gas.

STAR SERVICE REPRESENTATIVES

Wondering who to call with your Gas STAR questions or how to find out more about issues raised at recent Gas STAR events? Last year, EPA initiated a STAR service representative program to help enhance your participation and experience with Natural Gas STAR. Your representative is prepared to:

- ✓ Act as a central point of contact to answer all of your program-related questions
- ✓ Assist you in preparing and submitting annual reports and implementation plans
- ✓ Facilitate information exchange among partners and share lessons learned
- ✓ Keep you up-to-date on program events and news

David Frank 703/841-0588 or dfrank@erg.com

Jim Knaack 703/841-4378 or jknaack@erg.com

Trevor Quinn 703/841-4816 or tquinn@erg.com

Jocelyn Spielman 703/841-0557 or jspielma@erg.com

Partner feedback on this service has been very positive. This past year, service representatives have helped a number of partners identify appropriate participants to contact for more information about specific BMPs and PROs. To the left are the service representatives and their contact information.

If you are not sure who your representative is, look on our web site at **www.epa.gov/gasstar** or call Jim Knaack at 703/841-4378.

Early Credit Legislation Proposed in House

Representatives Rick Lazio (R-IA) and Calvin Dooley (D-CA) unveiled the Credit for Voluntary Actions Act (H.R. 2520) on July 14, 1999. The bill was referred to the House Commerce Committee. Co-sponsors included Representatives Boehlert (R-NY), Kind (D-WI), Castle (R-DE), Moran (D-VA), Saxton (R-NJ), Roemer (D-IN), Ganske (R-IA), Maloney (D-CT), Gilchrest (R-MD), Price (D-NC), and Smith (D-WA).

Like the Credit for Voluntary Reductions Act (S. 547) proposed by the late Senator Chafee (R-RI) and others in March 1999, H.R. 2520 would authorize the President to enter into agreements providing credit for voluntary early actions that mitigate the potential impact of greenhouse gases. The credit could be applied in any future domestic program regulating greenhouse gas emissions. It also allows for retroactive credit—one ton of reduction credit for each ton of emissions reductions or carbon sequestration—for reductions carried out between 1991 and 1998 under a federal agency program, such as Natural Gas STAR.

This bill and other early action proposals were the topic of the keynote address by Vicki Arroyo Cochran of the Pew Center on Global Climate Change during the 6th Annual Natural Gas STAR Workshop in October.

Ms. Cochran's presentation sparked a discussion about the important role of voluntary programs such as Natural Gas STAR in reducing the risk of global climate change.

For more information or for the text of these bills, visit the House web site at http://www.house.gov, or the bill locator at http://www.THOMAS.loc.gov. Ms. Cochran's presentation will be reproduced in the proceedings of the 1999 Natural Gas STAR Implementation Workshop. If you did not attend the workshop and would like a copy, contact Jon Passe at 202/564-9793 or at passe.jonathan@epa.gov.

Public/Private Partnership Offers Independent Technology Performance Data to the Gas Industry

The Greenhouse Gas Technology Verification Center is one of 12 independent performance verification organizations established under EPA's Environmental Technology Verification (ETV) Program. As a public/private partnership between EPA's Office of Research and Development and the Southern Research Institute (SRI), the Center tests and evaluates the performance of greenhouse gas (GHG) mitigation and monitoring technologies.

"If we reduce GHGs and provide industry with economically viable technologies, everyone wins—including the gas industry, the environment, and the technology vendor," says Steve Piccot, Director of the GHG Center. Common goals shared by EPA, SRI, and private industry partners have drawn the Center's focus toward GHG technologies that provide benefits beyond simply reducing GHGs. Locating and testing technologies that provide enhanced economic performance, improved process performance, or other benefits are central to the current mission of the Center.

In 1998, the Center began field evaluations of technologies applicable to the oil and natural gas industries. Technologies being evaluated include devices that reduce leaks from compressor rod seals, a new computer model-based continuous emission monitor for internal combustion (IC) engines, a low-leak liquid storage tank pressure relief valve, and an on-site electricity generation system for transmission compressor stations (Allied Signal microturbine).

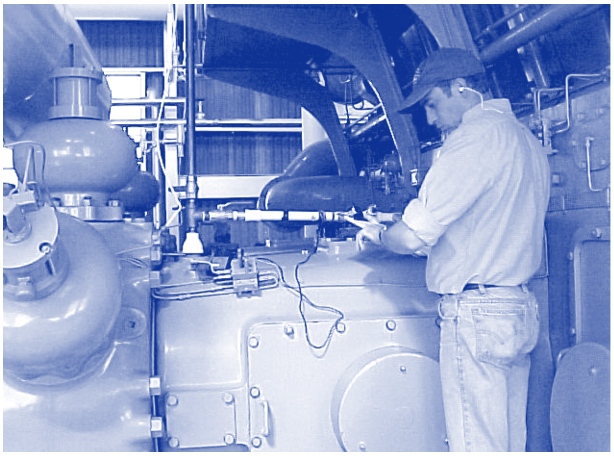
Reducing Methane Leaks from Natural Gas Compressors

In the natural gas industry, reciprocating compressors leak methane from blowdown valves, rod packing, unit isolation valves, pressure relief valves, and other fugitive sources. A large portion of these emissions is attributable to compressor rod packing; as a consequence, the Center has evaluated two different types of rod seal leak mitigation devices.

The Seal Assist System (SAS) is a secondary emission containment device designed to prevent compressor rod packing leaks. It allows existing rod packing leaks to continue, but the leaking gas is contained within a secondary containment gland. The contained gas is then collected, recompressed, and routed into the compressor engine fuel line for use. This captured gas represents not only the recovery of lost product and economic resources, but also the reduction of GHG emissions.

SAS was verified at a natural gas compressor station operated by Transwestern Pipeline Company of the Enron Gas Pipeline Group. Installed on three separate compressors, the system recovered from 3.7 scfm to 11.6 scfm of gas during Phase I testing and successfully injected this gas into the engine fuel line for use. The average gas recovery rate was 7.2 ± 0.22 scfm of gas, which equated to an average leak capture efficiency of 70 ± 10 percent. Recovery was reduced because a tertiary seal on the SAS was leaking. A new tertiary seal design is being integrated into the system. The final Phase 2 testing will report on the overall economic payback period of SAS.

The C. Lee Cook Static Pac™ device is the second compressor rod seal leak mitigation device independently verified by the Center. The Static Pac™ is designed to prevent rod packing leaks from escaping into the atmosphere during pressurized compressor standby periods. It is installed in a conventional packing case by replacing several rings. Upon shutdown of the compressor, the compressor control system activates the Static Pac™ and wedges a lip seal into contact with the rod, reducing or eliminating



ANR technician helps verify the C. Lee Cook Static Pac™ *at a compressor station.*

idle-mode emissions. Verified at a natural gas compressor station operated by ANR Pipeline Company (ANR) (see photo), the Static Pac™ was found to reduce 96 percent of rod packing emissions while the compressor was in an idle, pressurized state.

Continuous IC Engine Emissions Monitoring at a Low Capital Cost

Natural gas transmission companies often use large gas-fired IC engines to drive natural gas compressors. A parametric emissions monitoring system (PEMS) applicable to gas-fired IC engines has been developed by ANR Pipeline Company of Detroit, Michigan. The PEMS approach provides an alternative to conventional, instrumental continuous emission monitoring systems, with the potential to be more cost effective. It provides continuous readings of emissions of carbon dioxide (CO_2), carbon monoxide (CO), total hydrocarbons including methane (THC), oxygen (O_2), and nitrogen oxides (NO_x). The PEMS approach to monitoring exhaust emissions is based on establishing relationships between engine operating parameters (as determined by existing engine sensors) and exhaust emissions. Fundamentally, PEMS are computerized algorithms that describe the relationships between operating parameters and emissions without the use of continuous emission monitoring hardware.

ANR Pipeline Company requested that ETV verification be conducted, and a test was completed in August 1999 at an ANR compressor station. The ANR PEMS was tested over a full range of normal and off-normal engine operating conditions, and the relative accuracy of PEMS was determined by comparing PEMS emission predictions to emissions measured directly by in-stack instruments. The Verification Report is being prepared, and preliminary results suggest that the ANR PEMS is capable of producing emission rate predictions with relative accuracies that are similar to those expected for conventional, instrumental continuous emission monitoring systems.

Low Pollution Oil Storage Tank Protection

Approximately 900 storage tanks are in crude oil service in the United States. These tanks release volatile constituents contained in the crude oil, such as methane, ethane, hydrogen sulfide, and other volatile species. If a tank's pressure relief valve (PRV) does not completely seal the tank from the atmosphere, methane and regulated air pollutants can be emitted. The Protectoseal Company requested independent verification of its storage tank PRV technology—the PIN-TECH Bubble Tight <500ppm Relief Vent. The PIN-TECH device is designed to reduce fugitive emissions in the non-venting condition (i.e., the PRV is not venting tank gases to relieve a dangerous overpressure condition), and it is applicable to low pressure tanks (<15psig maximum).

This PRV design incorporates a unique steel buckling pin that the vendor claims sets the relief pressure and keeps the valve tight while in the non-venting mode. If the pressure inside the tank rises to the set point, the relief pin is designed to buckle, thus allowing the valve to vent pressure and keep from destroying the tank. Protectoseal claims that the PIN-TECH design provides positive sealing of the tank compared to more conventional weight or spring-loaded PRVs. The leak tightness of the system was verified by measuring emissions from several PIN-TECH valves in simulated crude oil service. These results were compared to similar tests of leak tightness conducted on selected conventional PRVs. The Verification Report is being prepared; preliminary results show the consistent leak tightness of the Pin-Tech PRV and suggest the PRV design may provide superior leak mitigation compared to some conventional PRV designs.

Companies interested in actively participating in Center activities and stakeholder groups can contact the Center via the Internet at www.sri-rtp.company/index.html, or by phone at 919-806-3456 (ask for Stephen Piccot, Center Director). Complete Verification Reports and Test Plans for the technologies described above can be viewed or downloaded from the web site.

WORKSHOP SUMMARY

The 6th Annual Natural Gas STAR Implementation Workshop

Thank you!

to the following organizations for their support of the 6th Annual Natural Gas STAR Implementation Workshop: American Gas Association, American Petroleum Institute, Enron Gas Pipeline Group, Interstate Natural Gas Association of America, and Natural Gas Supply Association.

STAR Partnership in Action

EPA and the natural gas industry celebrated the continuing success of their special partnership at the 6th Annual Natural Gas STAR Implementation Workshop in Houston, Texas. More than 80 participants attended the 2-day event, representing 30 partner companies, 15 prospective partners, and 3 endorsing organizations.

The workshop showcased partners' success in maximizing efficiency gains, gas savings, and environmental benefits through implementing the STAR Program. It provided a forum to highlight partner and program achievements, discuss experiences and new technologies or practices, learn about new STAR tools, and network with peers.

In sector-specific breakout sessions, partners discussed their experiences with specific Best Management Practices (BMPs) and other emissions reduction opportunities. EPA and STAR Partners also discussed the expansion of the STAR program—to include the gas processing sector and to allow interested partners to report projects that reduce CO_2 as well as methane.

Workshop Highlights

The Climate Change Debate

In a keynote address, Peter A. Zwart, Asset Manager for BP Amoco's operations in the San Juan Basin, highlighted his company's commitment to address climate change and the actions being taken to reduce greenhouse gas (GHG) emissions. Among BP Amoco's global initiatives are a GHG emissions inventory, a review of business systems and processes to identify opportunities for efficiency gains, the Clean Cities/Clean Fuels program, a pilot internal emissions trading system, and expansion of BP Amoco's Solarex business.

Mr. Zwart expanded on several initiatives in the company's Rocky Mountain region. The emissions reduction program there includes replacing about 4,000 high-bleed pneumatic controllers with no-bleed units, working with the U.S. Department of Energy on a large CO_2 sequestration project, and reducing gas-well venting during the unloading of production tubing.

Vicki Arroyo Cochran of the nonprofit Pew Center on Global Climate Change gave the second keynote address. The Pew Center

works with industry to promote the view that businesses should take concrete steps to assess opportunities for emissions reductions, establish emissions reduction objectives, and invest in more efficient technologies and practices. Ms. Cochran reviewed current developments in the climate change debate and international negotiations, noting the importance of early action by U.S. companies to reduce GHG emissions in advance of any future regulation. She summarized Congressional activity on early action, highlighting the key provisions of S. 547 (Chafee, Mack, Lieberman), H.R. 2520 (Lazio, Dooley), and other proposed legislation.

STAR Partners Share Best Practices

Technology transfer among partner companies is critical to the continuing success of the STAR Program. In sector-specific breakout sessions, partners gave brief presentations and fielded questions on recent projects and activities undertaken to reduce methane emissions.

Production Sector presentations covered the following topics:

- Texaco's Implementation of Gas STAR - Michael Milliet, Texaco E&P Inc.
- Conversion to Instrument Air - James Frederick, Spirit Energy/Unocal
- Increasing Dehydrator Efficiency - Robert Sandilos, Chevron USA Production Co.
- Increasing Well Efficiency for Independent Producers - John Martin, NYSERDA

Transmission/Distribution Sector presentations covered the following topics:

- El Paso's Valve Servicing Program - John Hazen, El Paso Natural Gas Company
- Experiences with the Hi-Flow Sampler™ - Marc Phillips, Enron Gas Pipeline Group
- Fugitive Emissions Management - Srikanth Venugopal, TransCanada Transmission
- Inspection and Maintenance Survey Results - Doug Andrew, Great Lakes Transmission
- NESCAUM Greenhouse Gas Trading Demonstration Project - Paul Lynch, Keyspan Energy

Gas Processors Discuss STAR Program Expansion

In a dedicated session for gas processing companies, participants discussed options for expanding the Natural Gas STAR Program to include gas processors. EPA led a discussion of relevant issues, including the methane emissions reduction potential for this sector, a review of STAR Program BMPs and Partner Reported Opportunities (PROs) and their applicability to gas processing, the development of a new MOU, and research and data needs. Participants—including STAR's Charter gas processing Partner GPM Gas Corporation—were enthusiastic about the program expansion and agreed to serve as an informal working group to move the new partnership forward.

Environmental Technology Verification Program Provides Opportunities for Testing New Technologies

After briefly describing EPA's Environmental Technology Verification (ETV) Program, Sushma Masemore presented specific information about the Greenhouse Gas Technology Performance Verification Program and the three natural gas industry technologies tested to date. See related article on pages 10-11 of this *Update*. For more information or to discuss a new technology, contact Stephen Piccot at 919/806-3456 or visit the ETV web site at http://www.sri-rtp.company.

STAR Implementation Tips

New and prospective partners heard an overview of the Natural Gas STAR Program in a dedicated session. Step-by-step procedures were offered for joining the program, developing an implementation plan, and streamlining the reporting process. Details on evaluating methane emissions reduction opportunities for implementation were also covered. Sharing his valuable experience with partners, Joe D'Emidio of Keyspan Energy explained how his company enhanced program implementation by communicating STAR's value throughout the company.

New Program Tools Unveiled

In a session for veteran partners, EPA's Natural Gas STAR Program Team unveiled new implementation tools, requested feedback on current tools, and heard suggestions for improving the program. The new tools—including videos, partner case studies, new Lessons Learned Summaries, and the emissions reductions summary report—are described in more detail on page 14 of this *Update*. Feedback received from STAR Program Partners will be incorporated into the final version of each product.

PROGRAM TOOLS

New Natural Gas STAR Tools

Superior Implementation Case Studies

The newly developed Superior Implementation Case Studies focus on how companies promote and implement the program internally, and how companies address challenges to participating in the Gas STAR Program. Case Studies on Brooklyn Union and El Paso Natural Gas Company will be available soon.

Revised Program Memorandum of Understanding (MOU)

At the suggestion of current and prospective partners, EPA is revising the Memorandum of Understanding (MOU) that formalizes participation in the STAR Program. The new draft MOU maintains the core elements of the original, but uses a one-page format and simplified language. The draft MOU was circulated for review at the recent annual workshop. Partners liked the shortened MOU and offered suggestions for further improvement. Review copies of the final draft have been sent to each partner for additional feedback. Current partners will not be required to re-sign the new version, but may do so if they choose. Once finalized, the new MOU will be posted on the Gas STAR web site.

Program Implementation Videos

The Natural Gas STAR Program has completed two new videos—one for production companies, the other for transmission and distribution companies. The videos are designed to help Implementation Managers and prospective partners educate employees about the STAR Program and to encourage strong industry participation. The videos provide an overview of the program, highlights of the recommended Best Management Practices with typical costs and savings information, and interviews with partners and industry association representatives.

Partner Reported Opportunities (PROs) on the Web

Brief Fact Sheets on Partner Reported Opportunities (PROs) give partners technical and economic information on various gas-saving technologies and practices. Based on experiences reported by STAR Partners, the Fact Sheets help partners evaluate new options for reducing emissions. Now, the complete set is available in both PDF and HTML formats on the Gas STAR web site at www.epa.gov/gasstar.

Emissions Reductions Summary Reports

As a service to partners, the STAR Program is developing company-specific Emissions Reductions Summary Reports (formerly introduced as Partner Benchmarking Reports). The reports will allow partners to verify Natural Gas STAR Program records with their own files and to compare their efforts with leading partners in their sector on a normalized basis. In addition, the reports will help partners identify innovative methane reduction opportunities being implemented by other companies. Company-specific data will be kept confidential.

Lessons Learned Summaries

In the Spring of 1999, the Natural Gas STAR Program surveyed partners for input on which PROs they would like developed into more detailed Lessons Learned Summaries. Based on partner feedback, data availability, and the potential emissions reduction and cost savings, the Gas STAR Program is developing new Lessons Learned Summaries of the following PROs:

- Using Hot Tapping for Pressure Connections
- Reducing System Pressures
- Converting Gas Pneumatics to Instrument Air

These new Lessons Learned Summaries will soon be available on the Natural Gas STAR web site at www.epa.gov/gasstar.

DOCUMENT REQUEST FORM

Name & Title: _____

Organization: _____

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City, State, Zip: _____

E-Mail Address: _____

Telephone #: _____ FAX #: _____

Date Requested: _____

Date Info Needed: _____

FedEx/UPS # (if info needed asap): _____

Please fax to your STAR Service Representative or directly to the Natural Gas STAR Program at 202/565-2077.

PLEASE INDICATE WHICH MATERIALS YOU WOULD LIKE TO RECEIVE:

LESSONS LEARNED

_____ 1. Directed Inspection and Maintenance at Compressor Stations
_____ 2. Directed Inspection and Maintenance at Gate Stations and Surface Facilities
_____ 3. Options for Reducing Methane Emissions from Pneumatic Devices in the Natural Gas Industry
_____ 4. Installation of Flash Tank Separators
_____ 5. Reducing Methane Emissions from Compressor Rod Packing Systems
_____ 6. Reducing Emissions When Taking Compressors Off-Line
_____ 7. Installing Vapor Recovery Units on Crude Oil Storage Tanks
_____ 8. Replacing Wet Seals with Dry Seals in Centrifugal Compressors
_____ 9. Reducing the Glycol Circulation Rates in Dehydrators
_____ 10. Replacing Gas-Assisted Glycol Pumps with Electric Pumps
_____ 11. Installing Plunger Lift Systems in Gas Wells
_____ 12. Using Pipeline Pump-Down Techniques To Lower Pipeline Pressure Before Maintenance

STAR IMPLEMENTATION TOOLS

_____ Decision Support Software
_____ Decision Support Software Manual
_____ Video - Production
_____ Video - Transmission/Distribution
_____ Case Study - El Paso Natural Gas
_____ Case Study - Brooklyn Union/Keyspan Energy

OUTREACH MATERIALS

_____ Natural Gas STAR Program Brochure
_____ Natural Gas STAR Marketing Package
_____ Natural Gas STAR Promotional Toolkit
_____ STAR Partner Update, Summer 1998
_____ STAR Partner Update, Spring 1999

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